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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,436

07/17/2006

Dov Avni

P-4333-US3

4457

49443 7590 03/03/2009  
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EXAMINER

DIEP, NHON THANH

ART UNIT

PAPER NUMBER

2621

MAIL DATE

DELIVERY MODE

03/03/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/551,436	<b>Applicant(s)</b> AVNI ET AL.	
	<b>Examiner</b> Nhon T. Diep	<b>Art Unit</b> 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 43-45, 47, 49-52 and 56-66 is/are pending in the application.
- 4a) Of the above claim(s) 61-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 43-45, 47, 49-52 and 56-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/29/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Newly submitted claims 61-66 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: New claims relate to a system for diluting images, classified in class 382, subclass 232.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 61-66 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 43-45, 49-52 and 58-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 6,184,922 B1), in view of Fukuhara et al (US 6,501,862 B1), Honda et al (US 2004/0225223 A1), and Kim et al (US 6,314,211), and further in view of Yomeyama (US 6,972,791 B1), Terada (US 6,124,888), Nishino (US 7,209,170 B2) and Hattori et al (cited in the previous office action).

As for claim 43, applicants claim “an in vivo device...”. In the tenth edition of Merriam-Webster’s Dictionary, the term in vivo is defined as “in the living body of a plant

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or animal”, while the definition of an endoscope is “a means for viewing the interior of a hollow organ”. The examiner would like to point out that an in vivo device and an endoscope are one in the same. That to say, each of the above two devices are used to view the interior of a body. Saito et al discloses a system for reconstructing an image, the system comprising: a controller to: receive selected image data from an in-vivo device (fig. 2, el. 6 and col. 7, ln 36-40); pre-process the selected image data; wherein the controller is to post process the reconstructed image data (fig. 14, el. 337) as specified in claim 43; and wherein the controller is to generate reconstructed image data based on said selected image data (fig. 14, el 338) as specified in claim 49; said image selected image data is produced by an in-vivo imager which captures a plurality of input image data corresponding to an image (fig. 2, el. 32) as specified in claim 51 and said selected image data is transmitted from an in vivo device via a transmitter (fig. 3, el. 54 and its output) as specified in claim 52. It is noted that Saito et al does not particularly disclose that:

- a. pre-process the selected image data by applying error correction, gradient evaluation or detecting edges; and the controller is to receive the selected image data from a swallowable capsule as specified in claim 50;

- b. the selected image data has been compressed using a dilation pattern and the reconstruction process involves interpolation, linear interpolation or produce additional image data resulting in reconstructed image data as specified in claims 43, 44 and 45;

c. the step of post process the interpolated image data involving the usage of a median filter as specified in claim 43; and

d. the diluting pattern is repeated in every four rows of the image, such that every second green pixel is selected from a first row, every blue pixel is selected from a second row, and every second red pixel is selected from a third row as specified in claim 43; wherein said dilution pattern further comprises selecting a same amount of red pixels and blue pixels and twice that amount of green pixels; wherein said dilution pattern further comprises selecting every second green pixel from said second row, and selecting no pixels from a fourth row; wherein said dilution pattern further comprises selecting every second red pixel from a fourth row, such that a same amount of green pixels and blue pixels are selected and twice that amount of red pixels are selected as specified in claims 58-60..

With regard to a: Honda et al, in fig. 1, paragraphs 0004 and 0052, teaches the using of a swallowable capsule to take images inside a living body and a video signal processing function for image data generation, a transmission signal generating function that performs mixing of a video signal and a sync signal, affixing of an error correction code, etc. And, therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to modify the system of Saito et al by using an endoscope or an in-vivo device to image the intestinal of a living body by way of non-invasive and less obstructive procedures and further more, applying error correction in pre-processing selected images to prevent error and to obtain better images.

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With regard to b: First of all dilution is interpreted as the process of making less concentrated, and Fukuhara et al, in fig. 9, teaches (a) an input picture as an original picture, that is an original picture 100 shown in FIG. 6, is shown at the left end. An initial picture (initial decoded picture or a drawing texture) 107 is shown at the center in this figure, the texture of the original picture is downsampled (thinned) by 1/4 both vertically and horizontally, thus by 1/16 as a whole. Other methods will be explained subsequently. The above is the processing by an encoder (this process is considered as the claim's compressed by dilution pattern of claim 43 and (b) the process of encoding original image by decimating and then performing interpolation to reconstruct encoded image to obtain original image and that interpolation of image produces additional image data. Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to encode original image by decimating and to reconstructing encoded image by interpolation as taught by Fukuhara et al. Doing so would help to reduce bandwidth for transmission while simplifying the encoding process.

With regard to c: Kim et al teaches "in the step of post-processing, which performs a predetermined post-process together with the composite image interpolator, median filter is used to compensate for image deteriorated in the edge region. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Sato et al by applying median filter in the step of post processing as taught by Kim et al. Doing so would help to improve the quality of the new image (column 6, lines 42-53).

With regard to d: Yomeyama (fig. 4), Terada (col. 26, ln. 44-62), Nishino (fig. 6) and Hattori et al (column 7, lines 14-16), all teach pixel thinning that make the image less concentrated, and therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from a finite number of identified predictable solutions, and in this case to dilute image by repeating in every four rows of the image, such that every second green pixel is selected from a first row, every blue pixel is selected from a second row, and every second red pixel is selected from a third row or selecting a same amount of red pixels and blue pixels and twice that amount of green pixels or selecting every second green pixel from said second row, and selecting no pixels from a fourth row or selecting every second red pixel from a fourth row, such that a same amount of green pixels and blue pixels are selected and twice that amount of red pixels are selected.

4. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 6,184,922 B1), in view of Fukuhara et al, Honda et al, Kim et al, Yomeyama, Terada, Nishino and Hattori et al and further in view of He et al (US 6,600,517 B1).

As applied to claim 43 above, it is noted that the combination does not particularly disclose that the controller is to post process by a method selected from a group including: image sharpening, color suppression, intensity adjustment, convolution and applying a median filter as specified in claim 47. He et al teaches Post-processing circuitry is capable of carrying out several different types of video signal processing. Exemplary video signal processing functions performed by post-processing circuitry may include: noise reduction algorithms, color correction, scaling, scan-rate conversion,

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adaptive feature enhancement, and other adaptive object based algorithms. In an advantageous embodiment, post-processing circuitry 140 further comprises image sharpening circuitry capable of performing noise level adaptive sharpness enhancement (fig. 5 and col. 4, ln. 64 - col. 5, ln. 7). And, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of the above combination by applying the image sharpening circuitry to enhance resultant images.

5. Claims 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US 6,184,922 B1), in view of Fukuhara et al, Honda et al, Kim et al, Yomeyama, Terada, Nisihno and Hattori et al and further in view of Saitou (US 4,834,070).

As applied to claim 43 above, it is noted that the combination does not particularly disclose that wherein the dilution pattern used to select the selected image data is modified based on operating conditions of the in vivo device; and wherein the operating conditions are selected from a group consisting of: position of the in vivo device, pH, temperature, ambient lighting or color conditions as specified in claims 56-57. Saitou teaches the thinning of image signals based on the brightness threshold (col. 2, ln. 47-68). And, therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of the combination by thinning of image signals based on the brightness threshold as taught by Saitou. Doing so would help to obtain sharper image.

### ***Conclusion***



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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhon T. Diep whose telephone number is 571-272-7328. The examiner can normally be reached on m-f.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ND

/Nhon T Diep/  
Primary Examiner, Art Unit 2621